Managing stink bugs with insecticides

Thomas Turini
University of California Cooperative Extension
Vegetable Crops Advisor
Fresno County

Consperse Stink Bug in Fresno County

Consperse stink bug: *Euschistus conspersus*

Stink Bug Species Reported in CA

Say's stink bug complex: *Chlorochroa sayi* and *Chlorochroa uhleri*

Redshouldered stink bug: *Thyanta pallidovirens*

Consperse stink bug: *Euschistus conspersus*

Southern green stink bug: *Nezara viridula*

Most Stink Bugs Associated with Fresno Co. Tomatoes from 2013-2015 were Consperse

Photos by E. Hannon, Fresno County Ag Commissioner's Entomologist, 2014

Research Initiated in 2014

- Assess seasonal population development near high population density areas.
- Evaluate pheromone bated traps as potential tools for detection
- Compare insecticides/insecticide programs in processing tomatoes

Consperse Stink bug Phenology Model

53.6° F Developmental Threshold	
Egg development	150 $DD_{>54°}$
1^{st}-3^{rd} instar (small nymph)	408 $DD_{>54°}$
4^{th} – 5^{th} instar (large nymph	386 $DD_{>54°}$
Adult to Egg Laying*	275 $DD_{>54°}$
Total	1219 $DD_{>54°}$

***Estimated**

Cullen & Zalom, 2000

Monthly $DD_{>54°}$ Accumulation

FIVE_PTS.A (CIMIS #2, Five Points/WSFS USDA)

	30 yr	2015	2014	2013	2012
Jan	18.69	45.93	105.74	30.23	63.98
Feb	77.43	159.06	115.93	61.66	83.25
Mar	168.3	309.19	226.56	230.12	144.3
Apr	248.14	301.15	333.14	337.5	259.62
May	427.48	407.29	544.03	462.62	473.45
June	590	702.50	642.8	654.1	584.95
July	803.9	773.40	839.4	824.4	785.4
Aug	767.4	770.40	786.9	732.93	838.4
Sept	595.5	640.01	664.1	560.27	692.56
Oct	352.57	452.16	440.78	309.75	385.24
Nov	112.99	92.85	149.28	154.88	153.93
Dec	14.24	35.79	55.07	48.83	41.12

http://www.ipm.ucdavis.edu/calludt.cgi/DDMODEL?MODEL=CSB&CROP=tomatoes

Modified from Goodell, 2014

Monthly $DD_{>54°}$ Accumulation

FIVE_PTS.A (CIMIS #2, Five Points/WSFS USDA)

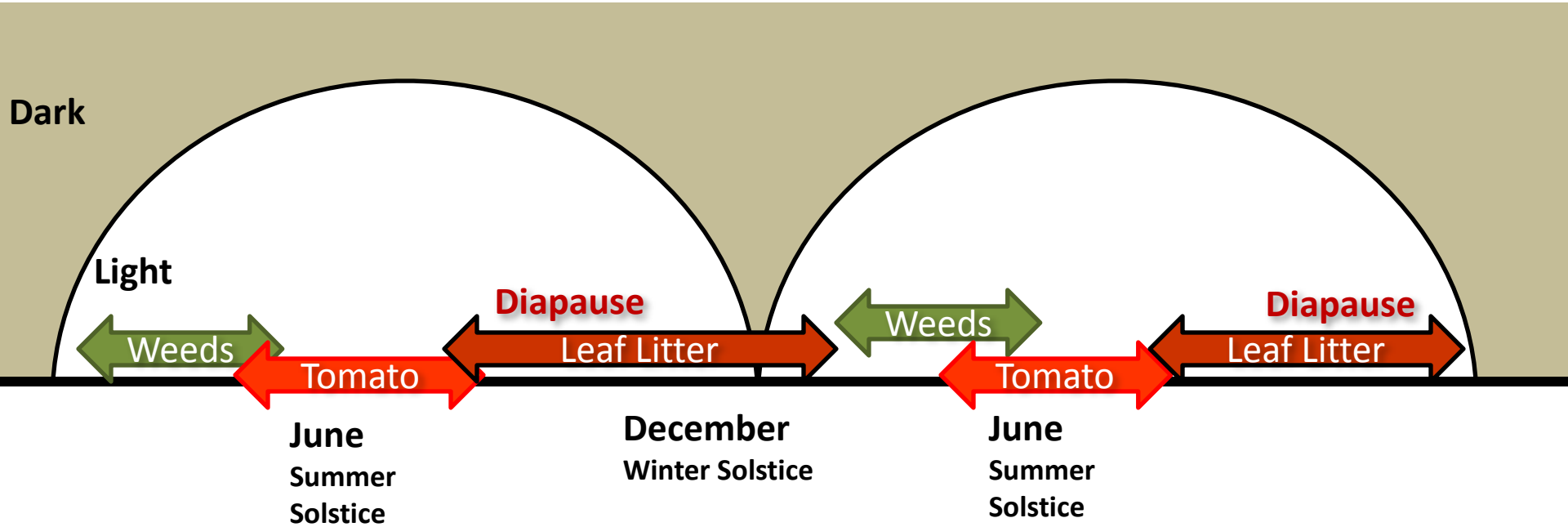
	30 yr	2015	2014	2013	2012
Jan	18.69	45.93	105.74	30.23	63.98
Feb	77.43	159.06	115.93	61.66	83.25
Mar	168.3	309.19	226.56	230.12	144.3
Apr	248.14	301.15	333.14	337.5	259.62
May	427.48	407.29	544.03	462.62	473.45
June	590	702.50	642.8	654.1	584.95
July	803.9	773.40	839.4	824.4	785.4
Aug	767.4	770.40	786.9	732.93	838.4
Sept	595.5	640.01	664.1	560.27	692.56
Oct	352.57	452.16	440.78	309.75	385.24
Nov	112.99	92.85	149.28	154.88	153.93
Dec	14.24	35.79	55.07	48.83	41.12

	$DD_{>54}$ > 30	$DD_{>54}$ > 30 year Avg
30 yr avg	4177	----
2015	4690	513
2014	4904	727
2013	4407	231
2012	4506	330

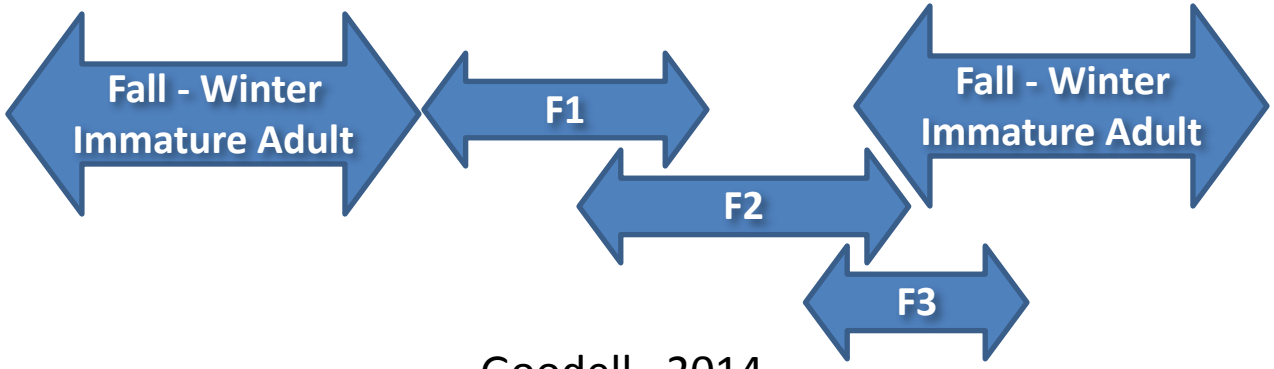
http://www.ipm.ucdavis.edu/calludt.cgi/DDMODEL?MODEL=CSB&CROP=tomatoes

Modified from Goodell, 2014

Consperse Stink Bug Schematic Life Cycle



- Russian Thistle
- Cheeseweed (little mallow)
- Mustard



Goodell, 2014

Pheromone baited traps were deployed in tomatoes and in high risk sites

Insecticide Trials
2014-15

Location : West Side Research and Extension Center – Fresno County
Plot size : single 60 inch bed x 75 ft
Untreated buffer between each treated row
Experimental design : 4 Replication Randomized Complete Block
Plant Dates: 5/21/2014 and 5/15/2015
Variety: H5608

Application details:
CO_2-powered backpack sprayer
50 gallons per acre
35 psi
3 Teejet 8004 EVS 19-in spacing
8 and 29 Aug 2014
18, 28 Jul, and 18 Aug 2015

Insecticide Trial Evaluations 2014-15

In-season: Three evaluations of fruit damage and stink bug counts of 4 feet under one side of canopy.

At harvest:

Harvest: 20 ft weigh all fruit

Hand sort of 30 to 35 lbs of fruit by quality (red, green, sunburn, rot & stink bug damage)

Lab analysis of 50 red fruit PTAB

Not all pesticides mentioned in this presentation are currently registered in tomatoes.

Carefully read all current labels before writing a pesticide recommendation

Insecticides with Activity against Stink Bug

IRAC #	Trade name	Common Name
> 80% control (adults and nymphs)		
3A	Baythroid	beta cyfluthrin
3A	Ambush, Pounce and others	permethrin
3A+4A	Warrior II + Actara	lambda-cyhalothrin + thiamethoxam
3A	Brigade, Bifenture, Capture, and others	bifenthrin
1B	Dimethoate	dimethoate
4A	Venom	dinotefuron
> 60% control (adults and nymphs)		
3A+4A	Leverage	beta-cyfluthrin + imidacloprid
3A	Warrior II	Lambda-cyhalothrin
4A	Actara	thiamethoxam
4A	Belay	clothianidin
1A	Lannate	methomyl
< 50% control of adults and > 80% control of nymphs		
3A	Hero, Mustang Max	S-cypermethrin

Modified from Zalom

Insecticides Selected for 2014 Trials

IRAC #*	Trade name	Common name
1A	Lannate	methomyl
1B	Dibrom 8E	naled
1B	Dimethoate	dimethoate
1B	Thionex	endosulfan
3A	Danitol	fenpopathrin
3A	Warrior II	lambda-cyhalothrin
3A + 4A	Endigo ZCX	lambda-cyhalothrin + thiamethoxam
3A + 4A	Leverage	imidicloprid + beta-cyfluthrin
3A + 28	Voliam Xpress	lambda-cyhalothrin + chlorantraniliprole
4A	Belay	clothianidin
4A	Venom	dinotefuran
21A	Torac	tolfenpyrad

* IRAC# mode of action as assigned by the Insecticide Resistance Action Committee

Insecticides Selected for 2014 Trials

Treatment (IRAC #)
Venom 70 SG 4 oz (4A)
Leverage 2.7 3.75 oz trap (3A + 4A)
Thionex 1 1/3 qts (1B)
Leverage 2.7 3.75 fl oz (3A)
Danitol 10.67 fl oz (3A)
Belay 4 oz + Warrior II 1.92 oz (3A + 4A)
Endigo CX 4.5 fl oz (3A + 4A)
Torac 21.0 fl oz (21A)
Warrior II 1.92 oz (3A)
Lannate SP 1 lb Asana 9.6 fl oz (1A + 3A)
Dibrom 8E 1.0 pts trap1 (1B)
Endigo ZCX 4.5 fl oz (3A + 4A)
Dibrom 8E 1.0 pts (1B)

* IRAC# mode of action as assigned by the Insecticide Resistance Action Committee

Stink bug efficacy, yield and quality 2014

		Fruit quality (%)				
Treatment	yield (t/a)	reds	greens	sunburn	rot	stink bug
Venom 70 SG 4 oz	39.24	60.83	12.44	10.01	9.99	6.72
Leverage 2.7 3.75 oz trap	40.82	73.46	5.31	4.25	9.52	7.47
Thionex 1 1/3 qts	45.80	74.35	6.54	4.34	5.33	9.41
Leverage 2.7 3.75 oz	40.84	55.88	10.09	9.83	13.86	10.34
Danitol 10.67 oz	37.40	66.04	9.84	4.92	8.49	10.71
Belay 4 oz + Warrior II 1.92 oz	41.80	69.46	5.76	5.36	7.36	12.05
Endigo CX 4.5 fl oz	37.22	59.62	15.77	4.45	7.29	12.87
Torac 21.0 fl oz	41.09	50.05	7.78	13.06	10.66	18.44
Warrior II 1.92 oz	37.00	60.67	8.72	5.73	6.41	18.48
Lannate SP 1 lb Asana 9.6 fl oz	47.52	58.43	14.55	2.46	6.00	18.56
Dibrom 8E 1.0 pts trap1	45.75	46.33	10.55	11.54	10.69	20.89
Endigo ZCX 4.5 fl oz	41.79	57.33	7.84	4.94	8.47	21.44
Dibrom 8E 1.0 pts	37.70	53.13	8.12	2.79	9.26	26.70
Dimethoate 1 pt	40.84	47.82	6.60	11.83	6.62	27.13
Untreated	38.91	52.84	7.02	7.46	7.30	25.38
LSD (P=0.05)^{s}	8.440	15.935	7.305	8.425	6.346	12.357
CV (%)	14.33	18.89	56.04	85.95	52.37	53.64

Unless otherwise specified all applications were made on 8 and 29 Aug. Treatments followed by 'trap' were applied on 18 Jul after 1st capture. Asana was applied on 15 Aug in addition to the Lannate applications on 8 and 29 Aug, H5608 planted 21 May and harvested 15-17 Sep

Stink bug efficacy, yield and quality 2014

		Fruit quality (%)				
Treatment	yield (t/a)	reds	greens	sunburn	rot	stink bug
Venom 70 SG 4 oz	39.24	60.83	12.44	10.01	9.99	6.72
Leverage 2.7 3.75 oz trap	40.82	73.46	5.31	4.25	9.52	7.47
Thionex 1 1/3 qts	45.80	74.35	6.54	4.34	5.33	9.41
Leverage 2.7 3.75 oz	40.84	55.88	10.09	9.83	13.86	10.34
Danitol 10.67 oz	37.40	66.04	9.84	4.92	8.49	10.71
Belay 4 oz + Warrior II 1.92 oz	41.80	69.46	5.76	5.36	7.36	12.05
Endigo CX 4.5 fl oz	37.22	59.62	15.77	4.45	7.29	12.87
Torac 21.0 fl oz	41.09	50.05	7.78	13.06	10.66	18.44
Warrior II 1.92 oz	37.00	60.67	8.72	5.73	6.41	18.48
Lannate SP 1 lb Asana 9.6 fl oz	47.52	58.43	14.55	2.46	6.00	18.56
Dibrom 8E 1.0 pts trap1	45.75	46.33	10.55	11.54	10.69	20.89
Endigo ZCX 4.5 fl oz	41.79	57.33	7.84	4.94	8.47	21.44
Dibrom 8E 1.0 pts	37.70	53.13	8.12	2.79	9.26	26.70
Dimethoate 1 pt	40.84	47.82	6.60	11.83	6.62	27.13
Untreated	38.91	52.84	7.02	7.46	7.30	25.38
LSD (P=0.05)^{s}	8.440	15.935	7.305	8.425	6.346	12.357
CV (%)	14.33	18.89	56.04	85.05	53.87	53.64

Unless otherwise specified all applications were made on 8 and 29 Aug. Treatments followed by 'trap' were applied on 18 Jul after 1st capture. Assana was applied on 15 Aug in addition to the Lannate applications on 8 and 29 Aug, H5608 planted 21 May and harvested 15-17 Sep.

Stink bug efficacy, yield and quality 2014

Treatment	yield (t/a)	Fruit quality (%)				
		reds	greens	sunburn	rot	stink bug
Venom 70 SG 4 oz	39.24	60.83	12.44	10.01	9.99	6.72
Leverage 2.7 3.75 oz trap	40.82	73.46	5.31	4.25	9.52	7.47
Thionex 1 1/3 qts	45.80	74.35	6.54	4.34	5.33	9.41
Leverage 2.7 3.75 oz	40.84	55.88	10.09	9.83	13.86	10.34
Danitol 10.67 oz	37.40	66.04	9.84	4.92	8.49	10.71
Belay 4 oz + Warrior II 1.92 oz	41.80	69.46	5.76	5.36	7.36	12.05
Endigo CX 4.5 fl oz	37.22	59.62	15.77	4.45	7.29	12.87
Torac 21.0 fl oz	41.09	50.05	7.78	13.06	10.66	18.44
Warrior II 1.92 oz	37.00	60.67	8.72	5.73	6.41	18.48
Lannate SP 1 lb Asana 9.6 fl oz	47.52	58.43	14.55	2.46	6.00	18.56
Dibrom 8E 1.0 pts trap1	45.75	46.33	10.55	11.54	10.69	20.89
Endigo ZCX 4.5 fl oz	41.79	57.33	7.84	4.94	8.47	21.44
Dibrom 8E 1.0 pts	37.70	53.13	8.12	2.79	9.26	26.70
Dimethoate 1 pt	40.84	47.82	6.60	11.83	6.62	27.13
Untreated	38.91	52.84	7.02	7.46	7.30	25.38
LSD (P=0.05)[s]	8.440	15.935	7.305	8.425	6.346	12.357
CV (%)	14.33	18.89	56.21	87.05	52.37	59.64

Unless otherwise specified all applications were made on 8 and 29 Aug. Treatments followed by 'trap' were applied on 18 Jul after 1st capture. Asana was applied on 15 Aug in addition to the Lannate applications on 8 and 29 Aug,H5608 planted 21 May and harvested 15-17 Sep

Stink bug efficacy, yield and quality 2014

		Fruit quality (%)				
Treatment	yield (t/a)	reds	greens	sunburn	rot	stink bug
Venom 70 SG 4 oz	39.24	60.83	12.44	10.01	9.99	6.72
Leverage 2.7 3.75 oz trap	40.82	73.46	5.31	4.25	9.52	7.47
Thionex 1 1/3 qts	45.80	74.35	6.54	4.34	5.33	9.41
Leverage 2.7 3.75 oz	40.84	55.88	10.09	9.83	13.86	10.34
Danitol 10.67 oz	37.40	66.04	9.84	4.92	8.49	10.71
Belay 4 oz + Warrior II 1.92 oz	41.80	69.46	5.76	5.36	7.36	12.05
Endigo CX 4.5 fl oz	37.22	59.62	15.77	4.45	7.29	12.87
Torac 21.0 fl oz	41.09	50.05	7.78	13.06	10.66	18.44
Warrior II 1.92 oz	37.00	60.67	8.72	5.73	6.41	18.48
Lannate SP 1 lb Asana 9.6 fl oz	47.52	58.43	14.55	2.46	6.00	18.56
Dibrom 8E 1.0 pts trap1	45.75	46.33	10.55	11.54	10.69	20.89
Endigo ZCX 4.5 fl oz	41.79	57.33	7.84	4.94	8.47	21.44
Dibrom 8E 1.0 pts	37.70	53.13	8.12	2.79	9.26	26.70
Dimethoate 1 pt	40.84	47.82	6.60	11.83	6.62	27.13
Untreated	38.91	52.84	7.02	7.46	7.30	25.38
LSD (P=0.05)[s]	8.440	15.935	7.305	8.425	6.346	12.357
CV (%)	14.33	18.89	56.21	87.05	52.37	59.64

Unless otherwise specified all applications were made on 8 and 29 Aug. Treatments followed by 'trap' were applied on 18 Jul after 1st capture. Asana was applied on 15 Aug in addition to the Lannate applications on 8 and 29 Aug,H5608 planted 21 May and harvested 15-17 Sep

Stink bug efficacy, field evaluations, 2014

	Stink bug counts (per 4 ft)			Stink bug damage (0-10)		
Treatment	21-Aug	28-Aug	5-Sep	21-Aug	28-Aug	5-Sep
Venom 70 SG 4 oz	0.0	2.0	0.8	1.0	3.3	2.0
Leverage 2.7 3.75 oz trap	0.0	0.0	1.0	1.0	0.5	1.0
Thionex 1 1/3 qts	1.3	0.3	0.5	0.8	1.0	1.0
Leverage 2.7 3.75 oz	0.8	3.8	0.8	1.3	2.0	1.0
Danitol 10.67 oz	0.4	3.2	1.6	0.6	4.0	1.0
Belay 4 oz + Warrior II 1.92 oz[v]	1.5	0.5	1.3	1.5	1.5	1.0
Endigo CX 4.5 fl oz	0.5	3.0	3.3	1.0	2.0	2.0
Torac 21.0 fl oz	1.0	1.3	1.8	2.3	2.3	2.3
Warrior II 1.92 oz	0.8	1.3	1.0	1.5	1.5	1.0
Lannate SP 1 lb/Asana 9.6 fl oz	0.5	1.0	2.3	1.3	1.0	2.0
Dibrom 8E 1.0 pts trap	0.3	2.3	2.5	1.5	4.0	2.3
Endigo ZCX 4.5 fl oz	1.3	1.3	0.3	2.8	1.8	0.7
Dibrom 8E 1.0 pts	0.0	0.5	4.3	1.5	1.8	1.7
Dimethoate 1 pt	1.0	3.3	3.0	2.8	3.5	3.7
Untreated	1.3	0.5	4.0	4.5	2.8	3.3
LSD (P=0.05)[t]	NS[s]	3.05	3.23	1.93	2.24	1.39
CV (%)	149.46	133.74	120.69	80.74	71.74	55.45

Unless otherwise specified all applications were made on 8 and 29 Aug. Treatments followed by 'trap' were applied on 18 Jul after 1st capture. Asana was applied on 15 Aug in addition to the Lannate applications on 8 and 29 Aug,
H5608 planted 21 May and harvested 15-17 Sep

Insecticides Selected for 2015 Trials

IRAC #*	Trade name	Common name
1B	Dimethoate	dimethoate
3A	Danitol	fenpopathrin
3A	Warrior II	lambda-cyhalothrin
3A	Danitol	fenpropathrin
3A + 4A	Endigo ZCX	lambda-cyhalothrin + thiamethoxam
3A + 4A	Leverage	imidicloprid + beta-cyfluthrin
4A	Belay	clothianidin
4A	Venom	dinotefuran
4C	Sequoia	sulfoxaflor
4D	Silvanto	flupyradifurone
7C	Knack	pyriproxyfen
9C	Beleaf	flonicamid
15	Rimon	novaluron
21A	Torac	tolfenpyrad
28	Exirel	chlorantraniliprole

* IRAC# mode of action as assigned by the Insecticide Resistance Action Committee

Materials Tested, 2015

Trade name of material tested (common name-IRAC mode of action number)
Dimethoate 4EL 1.0 pts + Leverage 2.7 3.75 fl oz (1B + 3A + 4A)
Warrior II 1.92 fl oz (3A)
Endigo CX 4.5 fl oz (3A + 4A)
Leverage 2.7 3.75 fl oz (3A + 4A)
Warrior II 1.92 oz + Beleaf 50SG 2.8 fl oz (3A + 9C)
Danitol 10.67 oz + Knack 8.0 fl oz (3A + 7C)
Warrior II 1.92 oz + Rimon 0.83EC 12.0 fl oz (3A + 15)
Belay 4 oz (clothianidin – 4A) + Beleaf 50SG 4.28 fl oz (4A + 9C)
Venom 70 SG 4 oz (4A)
Sequoia 4.5 fl oz (4C)
Silvanto 14 fl oz (4D)
Beleaf 50SG 4.28 fl oz (9C)
Torac 21.0 fl oz (21A)
Exirel 20.5 fl oz (28)
Untreated

Influence of Insecticide Treatments on Yield and Quality, 2015

		Fruit quality (%)[z]				
Treatment[x]	yield (t/a)[w]	reds	greens	Sun burn	rot	stink bug
Warrior II 1.92 oz + Beleaf 50SG 2.8 fl oz	56.51	67.41	8.43	2.01	2.95	21.16
Warrior II 1.92 fl oz	51.11	64.59	6.23	3.41	3.45	22.33
Warrior II 1.92 oz + Rimon 0.83EC 12.0 fl oz	60.75	69.71	6.86	0.62	2.14	24.62
Danitol 10.67 oz + Knack 8.0 fl oz	54.01	66.15	5.67	1.85	1.25	25.08
Endigo CX 4.5 fl oz	53.91	60.57	6.94	1.54	3.85	27.10
Beleaf 50SG 4.28 fl oz	53.37	61.48	7.93	1.85	0.88	27.86
Sequoia 4.5 fl oz	59.68	61.94	5.00	1.53	3.40	28.13
Dimethoate 4EL 1.0 pts + Leverage 2.7 3.75 fl oz	53.80	62.96	5.69	1.67	1.82	31.65
Leverage 2.7 3.75 oz	53.22	57.88	4.83	2.33	2.31	32.64
Silvanto 14 fl oz	48.80	53.47	3.86	2.93	5.96	33.78
Exirel 20.5 fl oz	60.67	51.58	7.37	3.19	2.66	35.20
Belay 4 oz + Beleaf 50SG 4.28 fl oz	54.24	50.59	7.17	2.65	3.48	36.11
Torac 21.0 fl oz	54.42	55.85	5.51	2.40	1.34	36.74
Venom 70 SG 4 oz	53.62	49.44	6.10	2.10	2.99	39.38
Untreated	53.62	49.87	6.32	2.70	5.59	35.52
LSD (P=0.05)[u]	9.967	15.935	3.265	1.950	3.412	19.197
CV (%)	12.61	18.89	36.55	62.50	87.01	44.13

Influence of Insecticide Treatments on Yield and Quality, 2015

		Fruit quality (%)[z]				
Treatment[x]	yield (t/a)[w]	reds	greens	Sun burn	rot	stink bug
Warrior II 1.92 oz + Beleaf 50SG 2.8 fl oz	56.51	67.41	8.43	2.01	2.95	21.16
Warrior II 1.92 fl oz	51.11	64.59	6.23	3.41	3.45	22.33
Warrior II 1.92 oz + Rimon 0.83EC 12.0 fl oz	60.75	69.71	6.86	0.62	2.14	24.62
Danitol 10.67 oz + Knack 8.0 fl oz	54.01	66.15	5.67	1.85	1.25	25.08
Endigo CX 4.5 fl oz	53.91	60.57	6.94	1.54	3.85	27.10
Beleaf 50SG 4.28 fl oz	53.37	61.48	7.93	1.85	0.88	27.86
Sequoia 4.5 fl oz	59.68	61.94	5.00	1.53	3.40	28.13
Dimethoate 4EL 1.0 pts + Leverage 2.7 3.75 fl oz	53.80	62.96	5.69	1.67	1.82	31.65
Leverage 2.7 3.75 oz	53.22	57.88	4.83	2.33	2.31	32.64
Silvanto 14 fl oz	48.80	53.47	3.86	2.93	5.96	33.78
Exirel 20.5 fl oz	60.67	51.58	7.37	3.19	2.66	35.20
Belay 4 oz + Beleaf 50SG 4.28 fl oz	54.24	50.59	7.17	2.65	3.48	36.11
Torac 21.0 fl oz	54.42	55.85	5.51	2.40	1.34	36.74
Venom 70 SG 4 oz	53.62	49.44	6.10	2.10	2.99	39.38
Untreated	53.62	49.87	6.32	2.70	5.59	35.52
LSD (P=0.05)[u]	9.967	15.935	3.265	1.950	3.412	19.197
CV (%)	12.61	18.89	36.55	62.50	87.01	44.13

Influence of Insecticide Treatments on Yield and Quality, 2015

		Fruit quality (%)[z]				
Treatment[x]	yield (t/a)[w]	reds	greens	Sun burn	rot	stink bug
Warrior II 1.92 oz + Beleaf 50SG 2.8 fl oz	56.51	67.41	8.43	2.01	2.95	21.16
Warrior II 1.92 fl oz	51.11	64.59	6.23	3.41	3.45	22.33
Warrior II 1.92 oz + Rimon 0.83EC 12.0 fl oz	60.75	69.71	6.86	0.62	2.14	24.62
Danitol 10.67 oz + Knack 8.0 fl oz	54.01	66.15	5.67	1.85	1.25	25.08
Endigo CX 4.5 fl oz	53.91	60.57	6.94	1.54	3.85	27.10
Beleaf 50SG 4.28 fl oz	53.37	61.48	7.93	1.85	0.88	27.86
Sequoia 4.5 fl oz	59.68	61.94	5.00	1.53	3.40	28.13
Dimethoate 4EL 1.0 pts + Leverage 2.7 3.75 fl oz	53.80	62.96	5.69	1.67	1.82	31.65
Leverage 2.7 3.75 oz	53.22	57.88	4.83	2.33	2.31	32.64
Silvanto 14 fl oz	48.80	53.47	3.86	2.93	5.96	33.78
Exirel 20.5 fl oz	60.67	51.58	7.37	3.19	2.66	35.20
Belay 4 oz + Beleaf 50SG 4.28 fl oz	54.24	50.59	7.17	2.65	3.48	36.11
Torac 21.0 fl oz	54.42	55.85	5.51	2.40	1.34	36.74
Venom 70 SG 4 oz	53.62	49.44	6.10	2.10	2.99	39.38
Untreated	53.62	49.87	6.32	2.70	5.59	35.52
LSD (P=0.05)[u]	9.967	15.935	3.265	1.950	3.412	19.197
CV (%)	12.61	18.89	36.55	62.50	87.01	44.13

Paired comparisons lambda cyhalothrin containing treatments vs. those without: P=0.025

Influence of Insecticide Treatments on Yield and Quality, 2015

		Fruit quality (%)[z]				
Treatment[x]	yield (t/a)[w]	reds	greens	Sun burn	rot	stink bug
Warrior II 1.92 oz + Beleaf 50SG 2.8 fl oz	56.51	67.41	8.43	2.01	2.95	21.16
Warrior II 1.92 fl oz	51.11	64.59	6.23	3.41	3.45	22.33
Warrior II 1.92 oz + Rimon 0.83EC 12.0 fl oz	60.75	69.71	6.86	0.62	2.14	24.62
Danitol 10.67 oz + Knack 8.0 fl oz	54.01	66.15	5.67	1.85	1.25	25.08
Endigo CX 4.5 fl oz	53.91	60.57	6.94	1.54	3.85	27.10
Beleaf 50SG 4.28 fl oz	53.37	61.48	7.93	1.85	0.88	27.86
Sequoia 4.5 fl oz	59.68	61.94	5.00	1.53	3.40	28.13
Dimethoate 4EL 1.0 pts + Leverage 2.7 3.75 fl oz	53.80	62.96	5.69	1.67	1.82	31.65
Leverage 2.7 3.75 oz	53.22	57.88	4.83	2.33	2.31	32.64
Silvanto 14 fl oz	48.80	53.47	3.86	2.93	5.96	33.78
Exirel 20.5 fl oz	60.67	51.58	7.37	3.19	2.66	35.20
Belay 4 oz + Beleaf 50SG 4.28 fl oz	54.24	50.59	7.17	2.65	3.48	36.11
Torac 21.0 fl oz	54.42	55.85	5.51	2.40	1.34	36.74
Venom 70 SG 4 oz	53.62	49.44	6.10	2.10	2.99	39.38
Untreated	53.62	49.87	6.32	2.70	5.59	35.52
LSD (P=0.05)[u]	9.967	15.935	3.265	1.950	3.412	19.197
CV (%)	12.61	18.89	36.55	62.50	87.01	44.13

In-Season Stink Bug Densities and Damage Assessment, 2015

	Stink bug counts (per 4 ft)[z]			Stink bug damage (0-10)[y]		
Treatment[x]	14 Aug	28-Aug	11-Sep	14 Aug	28-Aug	11-Sep
Warrior II 1.92 oz + Beleaf 50SG 2.8 fl oz	0.0	1.0	5.3	0.3	0.8	3.5
Warrior II 1.92 fl oz	0.5	0.8	1.0	1.0	1.5	1.8
Warrior II 1.92 oz + Rimon 0.83EC 12.0 fl oz	0.0	1.0	3.3	0.8	2.0	3.3
Danitol 10.67 oz + Knack 8.0 fl oz	0.5	1.0	4.0	0.5	1.0	4.3
Endigo CX 4.5 fl oz	0.0	0.3	2.5	0.0	0.3	2.5
Beleaf 50SG 4.28 fl oz	0.0	2.3	4.8	0.0	1.3	3.3
Sequoia 4.5 fl oz	0.0	0.0	6.0	0.0	0.3	5.5
Dimethoate 4EL 1.0 pts + Leverage 2.7 3.75 fl oz	0.8	0.0	4.5	0.8	0.3	3.8
Leverage 2.7 3.75 oz	0.0	1.5	0.8	0.3	2.0	1.5
Silvanto 14 fl oz	2.5	1.8	2.0	0.8	2.0	2.0
Exirel 20.5 fl oz	0.0	0.0	2.3	0.0	0.5	2.3
Untreated	1.8	1.3	1.3	1.0	1.3	2.0
Belay 4 oz + Beleaf 50SG 4.28 fl oz	0.0	0.5	10.8	0.3	0.5	5.8
Torac 21.0 fl oz	0.5	2.0	4.5	0.5	1.3	4.3
Venom 70 SG 4 oz	0.5	0.5	5.8	1.0	0.8	4.8
LSD (P=0.05)[t]	NS[s]	NS	NS	NS	NS	3.38
CV (%)	216.05	98.36	129.74	98.36	73.27	91.33

z The experimental area was transplanted on 15 May with cv. H5608 processing tomato plants at UC West Side Research and Extension Center. Foliar applications were made with a backpack sprayer at 50 gpa. All applications were made on 18, 28 Jul, and 18 Aug.

w Yields per acre were calculated based on a hand harvest of 20 row feet from 17-21 Sep.

Summary

- Stink bugs can be at very high levels prior to detection in tomato canopy – pheromone baited traps aid in early detection
- Lambda cyhalothrin-containing treatments (Warrior II alone or tank mixed and Endigo) provided reduction of damage both seasons tested.
- Venom and Leverage provided a reduction in damage in 2014, but not in 2015.

Acknowledgements

- California Tomato Research Institute
- Daniel Delgado
- Pete Goodell
- Frank Zalom
- Les Ehler
- UC WSREC staff
- Growers and Ag consultants in Fresno and Kings Counties

Questions

Tom Turini
UC Cooperative Extension, Fresno County
taturini@ucanr.edu
559-375-3147